

SOUTH COAST AIR QUALITY MANAGEMENT DISTRICT

Preliminary Draft Staff Report

Proposed Amended Rule 1143 - Consumer Paint Thinners and Multi-Purpose Solvents

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Executive Summary

Rule 1143 – Consumer Paint Thinners and Multi-Purpose Solvents, was adopted on March 6, 2009, to implement Control Measure CTS-04 from the 2007 AQMP (“Air Quality Management Plan”) which calls for further emission reductions from categories not regulated by CARB, including paint thinners and multi-purpose solvents. The adopted rule had a two-tier VOC concentration limit beginning with the 300 grams per liter (g/L) VOC limit, effective January 1, 2010, and then with the final VOC limit 25 g/L, effective January 1, 2011. The expected emission reduction will be 5.94 tons per day (tpd) by the year 2011, and an additional 3.81 tpd by January 1, 2012, resulting in a total VOC reduction of 9.75 tpd by January 1, 2012, when the rule is to be fully implemented.

The rule was amended on June 4, 2010, to rescind the final VOC limit of 25 g/L, to comply with a court order by the Los Angeles County Superior Court.

On July 9, 2010, Rule 1143 was amended to reinstate the final VOC limit of 25 g/L of VOC, effective January 1, 2011 along with a one year sell-through provision allowing consumer paint thinners and multi-purpose solvents to be sold in the AQMD jurisdiction up to December 31, 2011, provided that the products were manufactured prior to January 1, 2011. Additionally, Rule 1143 was also amended to allow consumer paint thinners and multi-purpose solvents containing 300 g/L or higher VOC to be sold and used until April 1, 2011, provided that the product container shows product uses that includes thinning of industrial maintenance coatings, and the product was manufactured prior to July 9, 2010.

Staff recognizes that Rule 1143 currently does not take into consideration the artist materials industry. Artist solvents and thinners specifically manufactured for artists have been formulated, refined and purified to eliminate impurities specifically for artist applications. These niche products do not fall into the general category of consumer paint thinners and multi-purpose solvents used for architectural coating thinning and clean-up.

The California Air Resources Board (CARB) exempted the artist solvents and thinners, which they call “Artist’s Solvents/Thinners,” from their Consumer Products Regulations (CPR) provided that they are labeled to meet ASTM D4236-94 (March 2005) and packaged in containers with a capacity less than or equal to 32 fluid ounces (one quart).

Staff is proposing an amendment to the rule that would provide an exemption to artist solvents and thinners from adhering to the VOC requirements set forth in the rule. Staff believes the provision is necessary, however, because artist solvent and thinner products are designed to be used specifically with artist solvent-borne oil paints. Staff is currently unaware of low-VOC solvents that may be successfully reformulated for artist solvent and thinner products.

Therefore, staff is proposing the following amendment to Rule 1143:

- A definition for artist solvents and thinners, and

- Rule language to exempt artist solvents and thinners having a capacity of 32 fluid ounces or less and to be added to the exemptions section of Rule 1143, and
- Make any necessary minor clarifications and editorial corrections to the rule.

BACKGROUND

Consumer Products are the largest source of VOC emissions in the South Coast Air Basin (Basin). The California Air Resources Board (CARB), estimates that consumer products in the state of California account for approximately 245 tons per day (tpd) of VOC emissions. Approximately forty-five percent (45%) of that estimate or 110.3 tpd of VOC emissions can be attributed to the Basin.

The 2007 AQMP highlights the growing impact of VOC emissions from consumer products. Taking into account population growth and planned VOC reductions by CARB, the AQMP estimates that the annual average VOC emissions for the consumer product category will be 107 tpd by the year 2014, and will likely increase to 112.1 tpd by the year 2020. Rule 1143 implements Control Measure CTS-04 from the 2007 AQMP.

Consumer multi-purpose solvents work very well for cleaning deposits such as grease, oil, paint, carbon deposits, residues from tools, equipment, and general household uses, whereas consumer paint thinners are used to thin traditional solvent-based architectural coatings. However, based on staff's market assessment, traditional high-VOC containing consumer paint thinners and multi-purpose solvents are typically used interchangeably. PAR1143 changes this practice, since both consumer paint thinners and multi-purpose solvents are required to meet similar VOC limits prescribed in the rule.

RULE HISTORY

Rule 1143 - Consumer Paint Thinners and Multi-Purpose Solvents, was adopted on March 6, 2009, by the Governing Board and is currently in effect regulating consumer paint thinners and multi-purpose solvent products offered for sale and use within the Basin. Rule 1143 limits the VOC content in a two tier approach for products sold to consumers and these VOC limits apply to suppliers, distributors and retailers of consumer paint thinners and multi-purpose solvents. No public comments pertaining to artist solvents and thinners were received by staff during the nine-month rulemaking process.

On September 24, 2009, CARB amended the Consumer Products Regulations (CPR), with virtually the same VOC limits for consumer paint thinners and multi-purpose solvents, but with implementation dates of January 1, 2011 for the 30% by weight VOC limit and January 1, 2014 for the 3% by weight VOC limit. Additionally, CARB also included other provisions with statewide applicability, including the limitation of aromatic content, prohibition of the use of trichloroethylene, and limiting the use of products that exceed the 150 Global Warming Potential ("GWP"). CARB also included a sell-through provision for 3 years and when combined with implementation dates, the 30% by weight VOC limit will not be fully implemented until January 1, 2014 and the 3% by weight VOC limit will not be fully implemented until January 1, 2017. CARB also provided language in their CPR to exempt artist solvents and thinners provided they were sold in containers with a capacity of 32 fluid ounces (one quart) or less and they were properly labeled to meet the labeling requirements as specified in ASTM D4236-94 (March

2005).

On April 1, 2009, W.M. Barr filed a petition for writ of mandate and declaratory relief, challenging Rule 1143, primarily based on alleged inadequacies of the environmental assessment, including its analysis of safety issues, regarding the increased flammability as a result of compliant formulations that use acetone as an exempt solvent. On December 7, 2009, the court upheld the AQMD's environmental assessment except for the flammability issue. Subsequently, the AQMD filed a motion to limit the court's remedy. On April 1, 2010, the AQMD's motion was granted in part, but the judgment and writ required the AQMD to vacate the final VOC limits of the 25 g/L VOC limit, and prepare an Environmental Assessment (EA) that considers the fire hazard issue. To comply with the court's decision, the Governing Board amended Rule 1143 at the June 4, 2010 hearing and rescinded the final 25 g/L VOC limit, thus resulting in foregoing 3.81 tons per day of VOC emission reductions. On July 9, 2010, Rule 1143 was amended to reinstate the final 25 g/L VOC limit, effective January 1, 2011, and recover the foregone 3.81 tpd of VOC emissions, and completed a supplemental environmental assessment that focused only on the fire hazard issue, as directed by the court. During this rulemaking process, comments from the public were received requesting an exemption for artist solvents and thinners. Staff committed to further review the issue and committed to conduct a follow-up rulemaking that would include a new environmental assessment to analyze the potential increase in VOC emissions from this exemption.

AFFECTED FACILITIES

Artist solvents and thinners have been formulated and refined to eliminate impurities out of paint thinners and solvents specifically for artists, and do not fall into the general category of consumer paint thinners and multi-purpose solvents. AQMD staff has worked with CARB in regard to consumer paint thinners and multi-purpose solvents and is aware that CARB surveyed artist solvents and thinners during their 2006 Consumer and Commercial Products Survey (ARB 2007f)¹. CARB found the emissions from the artist solvents and thinners category had a minuscule effect on VOC reductions. CARB also found that artist solvents and thinners are required to meet the Labeling of Hazardous Art Materials Act (LHAMA) within the Federal Hazardous Substances Act which requires that any art material, including solvents, must meet the requirements in ASTM D4236-94 (March 2005), the standard Practice for Labeling Art Materials for Chronic Health Hazards, to protect consumers of any age from potential health hazards of these products. CARB exempted the artist solvents and thinners, which they call "Artist's Solvents/Thinners²," from the requirements of their CPR, provided said products are labeled to meet ASTM D4236-94 (March 2005) and packaged in containers with a capacity of 32 fluid ounces or less.

There are approximately 19 manufacturers of artist solvents and thinners products exclusively for the artist industry. The artist industry also includes support organizations and AQMD staff has

¹ CARB, 2006 Consumer and Commercial Products Survey, 2009, <http://www.arb.ca.gov/consprod/regact/2006survey/2006survey.htm>

² CARB, Consumer Products Regulations, August 7, 2009, <http://www.arb.ca.gov/regact/2009/cpmthd310/cpmthdisor.pdf>

had several discussions and correspondences with both the Artist Creative Materials Institute (ACMI) and the National Art Materials and Trade Association (NAMTA) to further understand their specific uses. Artist solvents and thinners are typically sold through hobby, craft, and art material store outlets and through internet sales.

DISCUSSION OF VARIOUS TYPES OF TECHNOLOGY FOR ARTIST SOLVENTS AND THINNERS

Artist solvents and thinners are manufactured specifically for a variety of art-related uses. Although there are products with a VOC content less than 25 g/L available and in use for consumer paint thinners and multi-purpose solvents, those may not be sufficient replacements for the currently used artist-related materials including turpentine, mineral spirits, odorless mineral spirits, and artist mediums. To meet the VOC limits in Rule 1143, consumer paint thinners and multi-purpose solvents have been reformulated using the following technologies; 1) Aqueous technology which includes formulations made from water, detergents, chelating agents, alkaline builders and various blends of surfactants and is typically used for multi-purpose cleaning agents, 2) Exempt solvents including acetone, PCBTF, and methyl acetate, as well as blends of the three, and, 3) Bio-based technology including methyl esters is currently available for a variety of uses, including lowering the volatility of exempt solvents.

The artist solvents and thinners are used specifically for arts and crafts and are broken down into the following solvent and thinner variants.

Turpentine

Turpentine is the traditional solvent that is manufactured from tree resins and has been used for oil on canvas painting for many years. Artist quality turpentines are further refined to remove the impurities commonly found in products sold at hardware stores for general consumer use. Turpentine is also known as Spirit of Turpentine, Oil of Turpentine, Genuine Turpentine, English Turpentine, Distilled Turpentine, Double Rectified Turpentine, and simply “Turps”.

Mineral Spirits

Mineral Spirits is a commonly used solvent that is manufactured from petroleum products. Mineral Spirits is generally less expensive than turpentine and a stronger solvent than Odorless Mineral Spirits. Mineral Spirits are used to reduce the viscosity of various acrylic resins to a range needed for application. Mineral Spirits are also used to remove (resolubilize) the varnish in case the artist is unhappy with the outcome of the painting and can be used for periodic cleaning or restoration of the work. Mineral Spirits is also known as White Spirits.

Odorless Mineral Spirits

Odorless Mineral Spirits is also a commonly used solvent that is manufactured from petroleum products. Odorless Mineral Spirits is marginally more expensive than Mineral Spirits but has been manufactured with less of the harmful aromatic solvents found in Mineral Spirits. As in the case of Mineral Spirits, Odorless Mineral Spirits are used to reduce the viscosity of various

acrylic resins to a range needed for application. Odorless Mineral Spirits are also used to remove (resolubilize) the varnish in case the artist is unhappy with the outcome of the painting and can be used for periodic cleaning or restoration of the work.

Citrus Based Thinners

Citrus based thinners are manufactured from food-grade citrus oils combined with nontoxic, nonflammable solvents and are used in some arts and crafts applications.

Artist Mediums

Artist mediums are used to modify artist oil paint straight from the tube. The mediums can be used to lengthen the drying time of the paint, make it thinner or alter the character of the paint from what comes out of the tube. Mediums can also be used to make the paint transparent or opaque and can also be used to alter gloss or matte sheen of the paint. Mediums are used for oil on canvas paintings to influence the color of a pigment.

Brush Cleaners

There are several ways to clean artist paint brushes that were used to apply the oil-based paint. The most common application technique for an artist is simply applying the paint with a paint brush. Artist paint brush bristles are made from animal hair such as hog's bristles, mongoose hair, red sable (weasel hair) and Siberian mink. The hair possesses several important properties for the artist such as maintaining a superfine point, smooth handling and good memory (where the bristles return to their original point between brush strokes). There are also synthetic brushes available which can offer durability and cost effectiveness.

INDUSTRY CONCERNS

Staff had a meeting with several members from the artist industry to hear their concerns with Rule 1143 and the need for exemptions for artist solvents and thinners. One of the major concerns is the ability to continue the use of artist solvents and thinners which are specifically formulated refined and purified to eliminate impurities for artist applications. Antique oil paintings normally found in the museums are restored by use of artist solvents. They are protected by a coating of varnish however, the varnish ages and must be removed before a new coat of varnish can be applied. This requires specialty artist solvents that will remove the varnish but will not attack the original painting oils. Other artist uses include using turpentine, tinted with paint, to make the special layering effects on an oil painting. Turpentine is also used for dissolving Damar varnish which is an essential solvent for an artist. The Damar resin will only dissolve in Gum Turpentine. The other main concern from the artist industry is that artists use handmade brushes that can cost \$50 to \$150 per brush. The brush is cleaned with turpentine and then oil, typically vegetable oil, is used to preserve the brush while it's not in use. The brush is cleaned with turpentine to clean the hairs of the oil before it is used again. The artist industry contends that an artist oil painting brush cannot be cleaned using soap and water mainly due to the oil paint chemistry and the soap will dry out the hairs. Cleaning a paint brush using mechanical means causes the hairs to break.

OVERVIEW: PROPOSED AMENDMENT TO RULE

Staff is proposing an amendment to the rule that would provide an exemption for artist solvents and thinners from the VOC requirements set forth in the rule. Staff believes the provision is necessary because artist solvent and thinner products are designed to be used with specific-to-artist solvent-borne paints, and successful low-VOC technology is currently unavailable.

CARB surveyed artist solvents and thinners during their 2006 Consumer and Commercial Products Survey (ARB 2007f) and they found the emissions from the artist solvents and thinners category had a minuscule effect on the overall VOC reductions for their CPR. CARB also found that artist solvents and thinners are required to meet the Labeling of Hazardous Art Materials Act (LHAMA) within the Federal Hazardous Substances Act which requires that any art material, including solvents, must meet the requirements in ASTM D4236-94 (March 2005), the Standard Practice for Labeling Art Materials for Chronic Health Hazards, to protect consumers of any age from potential health hazards of these products. Furthermore, ASTM D4236-94 (March 2005) also requires that the art material must be reviewed by a board certified or qualified toxicologist and labeled consistent with the standard. CARB also determined that after visiting several art material stores, they noted that the artist solvents and thinners were substantially priced higher compared to the sales prices per comparable volume of the products that were sold at home improvement, paint and hardware stores. CARB staff stated as part of the development of the CPR that they believed these products are unlikely substitutes for Multipurpose Solvent and Paint Thinner products and an exemption from the proposed VOC limits and provisions is appropriate for Artist's Solvents/Thinners, labeled to meet ASTM D4236-94 (March 2005) and packaged in containers with a capacity less than or equal to 32 fluid ounces.

AQMD staff researched the costs of artist solvents and thinners and compared them to equivalent products sold at home improvement, paint and hardware stores. AQMD staff found that for a common quart size, the artist products cost 67.6% more than the general use consumer paint thinners and multi-purpose solvents, whereas for the gallon size, the artist products cost 54.1% more than the general use consumer paint thinners and multi-purpose solvents. CARB exempted the artist solvents and thinners, which they call "Artist's Solvents/Thinners," from their CPR provided that they are labeled to meet ASTM D4236-94 (March 2005) and packaged in containers with a capacity less than or equal to 32 fluid ounces (one quart).

Staff is proposing a new definition to be added to Rule 1143 for "ARTIST SOLVENT/THINNER." This amendment proposes to exclude artist solvents and thinners that meet the above mentioned criteria from adhering to the VOC requirements set forth in the rule for Consumer Paint Thinners and Multi-Purpose Solvents.

Therefore, staff is proposing the following amendments to Rule 1143:

- A definition for artist paint thinners and solvents
- Rule language to exempt artist paint thinners and solvent to be added to the exemptions

section of current Rule 1143.

- Make minor clarifications and editorial corrections to the rule

EMISSION IMPACTS

Rule 1143 was developed to have two different VOC limit reductions. The interim limit, which is currently in effect, as of January 1, 2010, limits any consumer paint thinner and multi-purpose solvent to 300 g/L VOC but offers a sell-through provision up to December 31, 2010 to allow sales and use of high-VOC traditional solvents provided they were manufactured prior to January 1, 2010. When fully implemented, the interim reduction limit will reduce VOC emissions by 5.94 tons per day. The second reduction, the final limit, will commence on January 1, 2011 and the VOC limit will be reduced to 25 g/L. In addition, any consumer paint thinner and multi-purpose solvent manufactured prior to January 1, 2011 will have a sell-through allowance for products containing up to 300 g/L VOC, provided that they were manufactured prior to January 1, 2011. Furthermore, any consumer paint thinner and consumer multi-purpose solvent that displays the uses for the solvent on the container label that also includes thinning industrial maintenance coatings and was manufactured prior to July 9, 2010, will be allowed a sell-through allowance until April 1, 2011 for products that contain in the excess of 300 g/L VOC. When fully implemented, the 25 g/L VOC limit will reduce VOC emissions by another 3.81 tons per day thus resulting in a combined reduction of 9.75 tons per day. CARB's 2006 Consumer and Commercial Products Survey found that the statewide VOC emissions contribution for artist solvent and thinners was 252.7 pounds per day. AQMD staff uses 45% factor of the statewide emissions inventory based on population distribution to determine the South Coast AQMD jurisdiction emissions contribution,

$$252.7 \text{ lbs/day} * 0.45 = 113.7 \text{ lbs/day, and}$$

$$113.7 \text{ lbs/day} * 1 \text{ ton}/2000 \text{ lbs} = 0.057 \text{ tons per day}$$

Thus, the emissions foregone in the South Coast AQMD jurisdiction will be 113.72 lbs/day and is summarized in Table 1 below.

TABLE 1: BREAKDOWN OF EMISSIONS

INVENTORY DESCRIPTION	VOC EMISSIONS (tpd)
Rule 1143 Interim VOC Limit (300 g/L)	5.94
Rule 1143 Final VOC Limit (25 g/L)	3.81
Total Existing Emission Reductions Applied to Rule1143	9.75
Artist Solvent/Thinner Exemption	-0.057
Total Emission Reduction Applied to Rule 1143	9.69

The proposed amendments would result in a 0.62% of VOC emissions foregone.

$$(9.75 \text{ tpd} - 9.69 \text{ tpd})/9.75 \text{ tpd} = 0.0062 = 0.62\%$$

COST ANALYSIS

PAR1143 results in a cost savings to the industry, since they will be able to continue business as usual.

INCREMENTAL COST-EFFECTIVENESS

Under Health and Safety Code § 40920.6, the AQMD is required to perform an incremental cost analysis when adopting a Best Available Retrofit Control Technology (BARCT) rule or feasible measure required by the California Clean Air Act. To perform this analysis, the AQMD must (1) identify one or more control options achieving the emission reduction objectives for the proposed rule, (2) determine the cost effectiveness for each option, and (3) calculate the incremental cost effectiveness for each option. To determine incremental costs, the AQMD must “calculate the difference in the dollar costs divided by the difference in the emission reduction potentials between each progressively more stringent potential control option as compared to the next less expensive control option.”

The proposed amendments to Rule 1143 do not implement BARCT in a feasible control measure, and therefore § 40920.6 is inapplicable.

CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA)

Pursuant to California Environmental Quality Act (CEQA) and AQMD Rule 110, the AQMD staff is preparing a Notice of Preparation/Initial Study (NOP/IS) to solicit comments on the environmental analysis for the proposed project. Comments on the NOP/IS and at the CEQA scoping meeting will be responded to in the Draft Environmental Assessment (EA) for PAR 1143. Upon completion, the Draft EA will be circulated for a 45-day public review and comment period, and will be available at AQMD Headquarters, by calling the AQMD Public Information Center at (909) 396-2039, or by accessing AQMD’s CEQA website at: www.aqmd.gov/ceqa.

SOCIOECONOMIC ASSESSMENT

PAR 1143 allows for an artist solvents and thinners exemption that provides regulatory relief because low-VOC artist solvents and thinners are currently not available on the market.

DRAFT FINDINGS

Health and Safety Code § 40727 requires that prior to adopting, amending or repealing a rule or regulation, the AQMD Governing Board shall make findings of necessity, authority, clarity, consistency, non-duplication, and reference based on relevant information presented at the hearing. The draft findings are as follows:

Necessity – State and federal health-based ambient air quality standards for ozone are exceeded in the AQMD. An exemption for artist solvents and thinners is required since no low-VOC alternates have been identified for this niche category.

Authority - The AQMD Governing Board obtains its authority to adopt, amend, or repeal rules and regulations from Health and Safety Code §§ 39002, 40000, 40001, 40440, 40441, 40702, 41508, and 41700.

Clarity - The AQMD Governing Board has determined that Proposed Amended Rule 1143 – Consumer Paint Thinners and Multi-purpose Solvents, is written and displayed so that the meaning can be easily understood by persons directly affected by them.

Consistency - The AQMD Governing Board has determined that Proposed Amended Rule 1143 – Consumer Paint Thinners and Multi-purpose Solvents, is in harmony with, and not in conflict with or contradictory to, existing statutes, court decisions, federal or state regulations.

Non-Duplication - The AQMD Governing Board has determined that Proposed Amended Rule 1143 – Consumer Paint Thinners and Multi-purpose Solvents, does not impose the same requirement as any existing state or federal regulation, and the proposed amendments are necessary and proper to execute the powers and duties granted to, and imposed upon, the AQMD.

Reference - In adopting this regulation, the AQMD Governing Board references the following statutes which the AQMD hereby implements, interprets or makes specific: California Health and Safety Code §§ 40001, 40440, and 40702.

COMPARATIVE ANALYSIS

Health and Safety Code § 40727.2 – The Governing Board finds that PAR 1143 does not impose a new emission limit a standard, make an existing emission limit or standard more stringent, or impose new or more stringent monitoring, reporting, or recordkeeping requirements [See 40727.2 (g)].

DRAFT CONCLUSIONS AND RECOMMENDATIONS

Staff recommends that PAR 1143 be amended to align the artist solvents and thinners exemption with CARB's CPR.